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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
LONG, SCOTT

ART UNIT	PAPER NUMBER
1633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/763,049	ROBINSON ET AL.	
	Examiner	Art Unit	
	Scott D. Long	1633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-8,11-23,25-27,30-35,37-39,42,43 and 52-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-8,11-23,25-27,30-35,37-39,42,43 and 52-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/31/2007 has been entered.

Claim Status

Claims 1-3, 13-119, 23, 32-35, 37, 39, 52-53 have are amended. Claims 5, 9-10, 24, 28-29, 36, 40-41, and 44-51 are canceled. Claims 1-4, 6-8, 11-23, 25-27, 30-35, 37-39, 42-43, 52-56 are under current examination.

Information Disclosure Statement

The Information Disclosure Statements (IDS) filed on 31 October 2007 consisting of 3 sheet(s) are in compliance with 37 CFR 1.97. Accordingly, examiner has considered the Information Disclosure Statements.

Priority

This application claims benefit from as a CON of 08/187,879 filed on 01/27/1994 (US-PAT 6,841,381), which is a CIP of 08/009,833 filed on 01/27/1993 (US-PAT 5,643,578), which is a CIP of 07/855,562 filed 03/23/1992 (ABN). The instant application has been granted the benefit date, 23 March 1992, from the application 07/855,562. However, the parent, US-PAT 5,643,578, does not have benefit of (1) retroviral promoter, (2) SIV antigen, (3) rotavirus antigen, (4) microsphere encapsulation of DNA, (5) methods of immunization comprising combinations of influenza antigens. Therefore these limitations will be given the benefit of US-PAT 6,841,381, filed on 27 January 1994.

RESPONSE TO ARGUMENTS

Response to Arguments - Claim Rejections 35 USC § 102

Applicant's arguments regarding rejection of claims 1, 4, 8, 14, 16-17, 27 and 30-31 as being anticipated by Dyall-Smith et al. under 35 USC 102(b), see REMARKS, pages 8-10 and Claim amendments, filed 31 October 2007 have been fully considered and they are persuasive.

The teachings of Dyall-Smith et al. are directed to vaccines based on administration of bacteria comprising plasmids encoding antigens for the VP7 protein of human [rotavirus] serotype 4. In particular, Dyall-Smith et al. teach "suitable microorganisms expressing the major VP7 protein of human rotavirus serotype 4 or portions thereof of the cell surface will, on administration , enter the intestine, invade the

lining of the gut...causing the production of protective antibodies in situ" (col.2, lines 62-68). Dyall-Smith et al. also teach adenoviral and vaccinia vectors comprising genes for rotavirus antigens. Because the claim amendments have introduced limitations narrowing the scope of the instant claims to compositions consisting essentially of a set of plasmid vectors encoding rotavirus antigen, the teachings of Dyall-Smith et al. no longer anticipate the amended claims.

Therefore, the examiner hereby withdraws the rejection of claims 1, 4, 8, 14, 16-17, 27 and 30-31 as being anticipated by Dyall-Smith et al. under 35 USC 102(b).

Applicant's arguments regarding rejection of claims 1-4, 6, 11-23, 25, 30-35, and 42-43, as being anticipated by Eppstein et al. (US-5,049,386) under 35 USC 102(b), see REMARKS, pages 10-12 and Claim amendments, filed 31 October 2007 have been fully considered and they are persuasive.

The claim amendments directed to "sets of plasmid vectors" is not explicitly taught by Eppstein et al. Accordingly, the instant rejection is moot.

Therefore, the examiner hereby withdraws the rejection of claims1-4, 6, 11-23, 25, 30-35, and 42-43, as being anticipated by Eppstein et al. under 35 USC 102(b).

Applicant's arguments regarding rejection of claims 1-4, 6-7, 11-12, 14, 16-19, 25-26, 30-31, and 52-56 are rejected under 35 U.S.C. 102(b) as being anticipated by

Pistor et al. (Klin Wochenschr. 1988. 66:110-116) under 35 USC 102(b), see REMARKS, pages 12-13 and Claim amendments, filed 31 October 2007 have been fully considered and they are persuasive.

The claim amendments directed to "compositions consisting essentially of sets of plasmid vectors" is not explicitly taught by Pistor et al. Accordingly, the instant rejection is moot.

Therefore, the examiner hereby withdraws the rejection of claims 1-4, 6-7, 11-12, 14, 16-19, 25-26, 30-31, and 52-56 are rejected under 35 U.S.C. 102(b) as being anticipated by Pistor et al.

Response to Arguments – Obviousness Double Patenting

Applicant's arguments, see REMARKS, page 13, filed 13 October 2007 have been fully considered and they are persuasive.

The applicant has submitted a terminal disclaimer on September 14, 2007.

Therefore, the examiner hereby withdraws the rejection of claims 1-4, 6-7, 11-14, 16-22, 25-26, 30-31, 52-56 as being unpatentable over claims 1-19 of US-5,643,578 under obviousness-type double patenting.

Response to Arguments – 35 USC 112, 2nd paragraph

Applicant's arguments, see REMARKS, page 13, filed 13 October 2007 have been fully considered and they are persuasive.

The applicant has amended claims 37-39 to properly depend from claim 32, thereby overcoming the rejection.

Therefore, the examiner hereby withdraws the rejection of claims 37-39 under 35 USC 112, 2nd paragraph.

NEW GROUNDS OF REJECTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "the plasmid vector" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim. The examiner believes the applicant intended to recite "each plasmid vector" or "the plasmid vectors" as in similarly worded claims 15 and 16. Appropriate correction is required.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-4, 6-8, 11-23, 25-27, 30-35, 37-39, 42-43, 52-56 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. **THIS IS A NEW MATTER REJECTION.**

The methodology for determining adequacy of Written Description to convey that applicant was in possession of the claimed invention includes determining whether the application describes an actual reduction to practice, determining whether the invention is complete as evidenced by drawings or determining whether the invention has been set forth in terms of distinguishing identifying characteristics as evidenced by other descriptions of the invention that are sufficiently detailed to show that applicant was in possession of the claimed invention (*Guidelines for Examination of Patent Applications under 35 USC § 112, p 1 "Written Description" Requirement;* (Federal Register/Vol 66. No. 4, Friday, January 5, 2001; II Methodology for Determining Adequacy of Written Description (3.)).

Claims 1, 15, 16, 23, 32 and 52 are broadly drawn, such that they apply to methods comprising administration of a composition **consisting essentially of a set of plasmid vectors**.

However, there is no literal support for the claim language of the newly amended claims. The phrase "consisting essentially of" is not explicitly recited in the specification. According to MPEP 2111.03 [R-3], "The transitional phrase "consisting essentially of"

limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976)." The specification states, "this invention relates to a method of immunizing an individual, **comprising** introducing into the individual a DNA transcription unit (or units) which comprises DNA encoding a desired antigen or antigens" (page 2, lines 9-11, emphasis added). This teaching of the specification could be interpreted as much more open language than the proposed amendments. Therefore, the examiner believes this to be new matter.

In addition, there is no literal support for the claim language, "a set of plasmid vectors." Because this phrase is explicitly recited in the specification and the numerous examples do not seem to show using a set of plasmid vectors encoding influenza or rotavirus antigens, the examiner believes this to be new matter.

Furthermore, claims 16 and 53 include the limitation, "two or more sets of plasmid vectors." The embodiments of more than two sets of plasmids are particularly difficult to locate in the specification. Therefore, the examiner believes this to be new matter.

Finally, claim 23 is directed to "a composition consisting essentially of a set of microsphere encapsulated plasmid vectors." While the examiner has found an embodiment of vaccination using a single microsphere encapsulated plasmid encoding an influenza antigen, the examiner has not identified an embodiment that includes using a set of microsphere encapsulated plasmid vectors. Therefore, the examiner believes this to be new matter.

This new matter rejection could be overcome if the applicant can point to a specific embodiment which satisfies the proposed claim language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-8, 11-23, 25-27, 30-35, 37-39, 42-43, 52-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Felgner et al. (WO90/11092) in view of Huylebroeck et al. (Gene. June 1988. 66(2): 163-81) and further in view of Townsend et al. (Cell. November 1984; 39(1):13-25) and further in view of Atkinson et al. (US-

4,861,864, issued 29 Aug 1989) and further in view of Andrianov et al. (US-5,529,777, issued 25 June 1996).

Claims 1 and 16-17 are directed to methods of immunizing a vertebrate using a composition consisting essentially of a set of plasmid vectors in a physiologically acceptable medium, the plasmid vectors comprising DNA encoding an influenza virus antigen or a rotavirus antigen operatively linked to a DNA promoter, which elicits a humoral and/or cell-mediated immune response against a desired antigen. Claim 4 is directed to the limitation that the method is capable of eliciting a protective immune response. Claims 7 and 25-26 are directed to the further limitation that the virus is an influenza virus and the antigen is hemagglutinin. Claims 8 and 27 are directed to the further limitation that the virus is a rotavirus. Claims 30-31 are directed to the limitations of delivery to a "human mammal." Claim 32 is directed to using a gene gun to administer the compositions of the invention. Claims 15 and 23 are directed to administration of microsphere encapsulated plasmid vectors in a physiologically acceptable medium. The instant specification does not specifically define the scope of "microsphere encapsulated plasmid vectors." The specification's sole embodiment of microsphere encapsulated plasmid vectors is as alginate microspheres. Furthermore, the specification does not exclude liposome microspheres from being considered pharmaceutically acceptable.

Felgner et al. teach plasmid vectors comprising "therapeutic polynucleotides... [which] code for immunity-conferring polypeptides, which act as endogenous immunogens to provoke a humoral or cellular response, or both" (page 17, lines 31-34).

Felgner et al. suggest that tumor-specific antigens and viral protein antigens are appropriate for use in their invention (for example, page 4). Felgner et al. also teach intradermal, intramuscular administration (page 11, lines 33-37) of naked polynucleotides in pharmaceutically acceptable carriers (page 8, line 24) to vaccinate a human (page 8, line 34). Furthermore, Felgner et al. teach "polynucleotides may be...delivered into muscle or skin using a vaccine gun" (page 36, lines 15-18). Felgner et al. also teach liposomal microsphere formulations of plasmid DNA and administration to the lung; the examiner believes this satisfies the limitations directed to pharmaceutically acceptable microsphere encapsulated plasmid vectors, in light of the teachings of the specification, described above.

Felgner et al. do not teach specific antigens for influenza or rotavirus. Felgner et al. also do not specifically teach administration of set of plasmids encoding antigens, although they do teach co-transfection of two different plasmids to the cells.

Huylebroeck et al. teach plasmid DNA mediated gene transfer of two different influenza A antigens, including H1 hemagglutinin (abstract). Huylebroeck et al. teach cotransfection of plasmids and co-expression of hemagglutinin A and influenza matrix protein M_1 in animal cells.

Townsend et al. teach plasmids comprising hemagglutinin antigens. Townsend et al. also teach "isolated full-length influenza gene clones is now routine" (page 13, col.2). Furthermore, Townsend et al. teach, "there are implications for vaccine design...a vaccine that presents nucleoprotein in an appropriate form that could

stimulate crossreacrtive CTL memory might be crossprotective between pandemic influenza A viruses" (page 22, col.2).

Atkinson et al. teach a plasmid comprising cDNA of a rotavirus antigen for expression of VP7 (col. 4, lines 39-42). Atkinson et al. teach that an object of their invention is to provide a neutralizing antigen to rotavirus which is readily disseminated throughout the body with the concomitant greater exposure to the immune system (col.2, lines 34-37).

Huylebroeck et al. and Townsend et al. and Atkinson et al. do not specifically teach DNA vaccines. These references also do not teach immunization using sets of plasmids encoding the antigens.

Andrianov et al. teach "polymeric hydrogels are used to encapsulate antigen to form vaccines....microparticles are formed ....preferred polymers are alginate" (abstract) and "enhanced immunogenicity of microspheres formed of 95% alginate" (col., lines) and methods of oral and mucosal delivery. Andrianov et al. teach "the polymer is used to deliver nucleic acid which encodes antigen to cells where the nucleic acid is expressed" (col.12, lines 39-42).

It would have been obvious to the person of ordinary skill in the art at the time the invention was made to immunize a vertebrate against an influenza virus or rotavirus by administering a composition consisting essentially of a set of plasmid vectors comprising DNA encoding either influenza virus antigens or rotavirus antigens. Furthermore, it would have been obvious to use microencapsulation of plasmid DNA or

gene gun to administer the DNA vaccines. In addition, it would have been obvious to use sets of plasmids to administer plasmids comprising antigens.

Regarding the rationale for combining prior art elements according to known methods to yield predictable results, all of the claimed elements were known in the prior art and one skilled in the art could have combined the element as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Each of the elements (plasmids comprising influenza or rotavirus antigens, methods of DNA vaccination, and gene gun administration) are taught by Felgner et al. or Huylebroeck et al. or Townsend et al. or Atkinson et al. and further they are used as vaccines or are shown to be involved in inducing Cytotoxic T Lymphocyte responses. It would be therefore predictably obvious to use a combination of these elements in a DNA vaccine. The methods of combining the elements with "sets of plasmids" are predictable; and therefore they are likewise obvious. Co-administration of plasmids has been performed in the art and is merely a variation of administration. Also, Andrianov et al. suggests alginate microspheres for use in vaccines; therefore, it would be obvious to apply this technology to plasmid DNA vaccine formulations.

Therefore the method as taught by Felgner et al. in view of Huylebroeck et al. and further in view of Townsend et al. and further in view of Atkinson et al. and further in view of Andrianov et al. would have been *prima facie* obvious over the method of the instant application.

Conclusion

No claims are allowed.

Examiner Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Scott Long** whose telephone number is **571-272-9048**. The examiner can normally be reached on Monday - Friday, 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Joseph Woitach** can be reached on **571-272-0739**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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